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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,246	03/30/2004	Yaoming Zhang	46162-00008USPX	4831
24238	7590	05/22/2006	EXAMINER CONSILVIO, MARK J	
JENKENS & GILCHRIST 1401 MCKINNEY SUITE 2600 HOUSTON, TX 77010			ART UNIT 2872	PAPER NUMBER

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/813,246	ZHANG, YAOMING
	Examiner Mark Consilvio	Art Unit 2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 15 February 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 6, 15-18, 20, 23, 24 and 27 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5, 7-14, 19, 21, 22, 25, 26 and 28 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 August 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/30/2004.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Species I in the reply filed on 10/24/2005 is acknowledged.

Claims 6, 15-18, 20, 23, 24, and 27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

It is noted that, though applicant did not identify claims 20 and 27 to read on a non-elected species, the details of azimuth angle adjusting mechanism of claim 20 and of the sensor of claim 27 are not disclosed in combination with the embodiment corresponding to Species I. However, the drawings (fig. 12) do include the details of claim 20 in combination with the embodiment corresponding to Species IV and the specification (p. 16, lines 22-32) includes details of claim 27 in combination with the embodiment corresponding to non-elected Species II. Therefore, claims 20 and 27 have additionally been withdrawn from further consideration.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 03/30/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claims 1-5, 7-14, 19-22, 25, 26, and 28 are objected to because of the following informalities: Many claims do not use consistent terminology or have terms that lack proper antecedent basis.

For example, claim 1 recites the limitation "the sun altitudinal changing angle" in lines 10-11. There is insufficient antecedent basis for this limitation in the claim.

Additionally, claim 3 recites the limitation "the frame is two entirely identical parallel four-connecting-rod mechanism" in lines 2-3. First, "is" should be replaced by --comprises-- or --consists of--, etc.... Second, "mechanism" should be replaced by --mechanisms--. Third, "parallel four-connecting-rod mechanism" should be consistent with "the parallel connecting rod mechanism" of line 6.

These examples are not intended to be exhaustive and **ALL** claims should be checked for similar problems.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-5, 8-10, and 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, with respect to claims 2 and 3, the relationship between the frame and the connecting rods is unclear. If two connecting rods are parallel in a height direction and two connecting rods are parallel along the length, how can the frame be “a parallel four-connecting-rod mechanism” since only two connecting rods are ever parallel? Also, the limitation “can be hinged” is ambiguous as to whether the rod must be hinged. Further, the drawings and specification do not support the reflectors being respectively fixed on all parallel connecting rods but rather each reflector being attached to each of the vertical connecting rods. Claims 4, 5, 8-10, and 12-14 inherit these problems through dependency.

Claims 7, 8, 11, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between “the connecting rods”,

“a moving line” and “the rhombus” in claims 7 and 8. Claims 11 and 12 inherit this problem through dependency.

As a result of these problems, the claims are indefinite since the exact metes and bounds of the claims cannot be determined.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 19, 21, 22, 25, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura (JP Patent Publication No. 61-027517) in view of Dominguez (US Patent No. 4,883,340).

With respect to claim 1, Fujimura discloses or suggests a directed reflection light collecting device with planar reflectors, comprising two or more planar reflectors (1), an azimuth angle adjusting mechanism (i.e. 9-11 in fig. 2) and an altitudinal angle adjusting mechanism (6-8 in fig. 2), the azimuth angle adjusting mechanism including a driving mechanism (9-11 in fig. 2), wherein two or more planar reflectors are arranged in mutual parallel on a frame (6 in fig. 2), the altitudinal angle adjusting mechanism including at least one transversal main turning shaft (2 in fig. 2) parallel with planar reflectors, the frame being rotatably supported via this transversal main turning shaft, the altitudinal angle adjusting mechanism driving this frame in a controlled manner to move the planar reflectors, wherein the altitudinal changing angle of the planar

reflectors is half of the sun altitudinal changing angle. Fujimura does not expressly disclose the azimuth angle adjusting mechanism including a base, supports, and a circular rail with central axial line. However, Dominguez teaches an azimuth angle adjusting mechanism including a base (24), supports (32), and a circular rail (34) with central axial line (figs. 1 and 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the azimuth angle adjusting mechanism of Fujimura with the azimuth angle adjusting mechanism of Dominguez. One of ordinary skill in the art would have been motivated to do this to provide a rotational symmetric adjusting mechanism that does not require any particular initial azimuthal alignment and no restriction to rotational freedom.

With respect to claims 2 and 3, the combination of Fujimura and Dominguez discloses or suggests all the limitations of claim 1 as stated supra. Fujimura further teaches the planar reflectors (1 in fig. 2), pivoted in the middle by parallel pivoting rods (2 in fig. 2), the planar reflectors being fixed respectively on these parallel pivoting rods to adjust the altitudinal angle of planar reflectors and their mutual spacing. The combination does not expressly disclose the frame is two entirely identical parallel four-connecting-rod mechanism, respectively, on both sides of planar reflectors. However, the use of parallel connecting rods as a frame for reflectors is well known in the art. For example, Dominguez teaches parallel connecting rods (82, 84, 104, 106) in support of parallel reflectors (fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to provide parallel connecting rods on all sides of the reflectors such that it forms a “parallel four-connecting-rod mechanism” to support and articulate the reflectors. One of ordinary skill in the art would have been motivated to do this to provide a more durable structure capable of holding the reflectors in place, providing

protection during shipping and against the elements, and to facilitate collapse and folding of the reflectors (see Dominguez col. 10, lines 25-48).

With respect to claim 19, the combination of Fujimura and Dominguez discloses or suggests all the limitations of claim 1 as stated supra. Also, the combination suggests the driving mechanism to adjust the azimuth angle drives the supports and brings the planar reflectors on the frame to rotate around the central axial line of the circular rail to adjust its azimuth angle. Further, while Fujimura does not expressly disclose the azimuth changing angle of which being equal to a sun azimuth changing angle, thereby realizing directed projection of sunlight in the direction of the central axial line of the circular rail, Dominguez does teach such an arrangement (col. 6, lines 8-36). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the driving mechanism adjust the azimuth changing angle equal to a sun azimuth changing angle. One of ordinary skill in the art would have been motivated to do this so that the solar light reflecting device may be used to light the interior of a building from a rooftop position as taught by Dominguez.

With respect to claim 21, the combination of Fujimura and Dominguez discloses or suggests all the limitations of claims 1 and 19 as stated supra. The combination including the azimuthal driving mechanism of Dominguez further teaches the driving mechanism for adjusting the azimuth angle comprises a motor (52), including a reducer (60), and a drive gear (66) connected at the motor, including a reducer (60), output end, the driving mechanism being fixed on a base (24), a rail (34) in rigid connection with supports (32) and rotatably supported on the base via rollers (42) fixed on the base, the drive gear in contact with the rail to drive the rail itself together with the supports to rotate around the axial line. Though the combination does not

expressly disclose friction wheels, friction wheel are well known in art. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the drive gear system of Dominguez with a friction wheel system to reduce wear on and possible damage to the motor.

With respect to claim 22, the combination of Fujimura and Dominguez discloses or suggests all the limitations of claim 1 as stated supra. Further, Fujimura suggests the driving mechanism for adjusting the azimuth angle drives the supports and brings the planar reflectors on the frame to rotate around the axial line along the circular rail to adjust the azimuth angle, the azimuth changing angle of the frame, the planar reflectors on the frame and the supports for the frame is half of the azimuth changing angle of the sun so that by selecting proper initial conditions, it can be realized to project sunlight in a fixed direction other than the central axial line of the circular rail (see abstract).

With respect to claim 25, Fujimura discloses or suggests the collecting device can also include a sensor (2a, 2b in fig. 3) to monitor the sun position and processing circuit (3 in fig. 3), the output signal from the sensor being output to the processing circuit to control the altitudinal angle and azimuth angle adjusting mechanisms (see abstract).

With respect to claim 28, the combination of Fujimura and Dominguez discloses or suggests all the limitations of claim 1 as stated supra. Fujimura is silent to the planar reflectors being glass mirrors or flat plates with high-efficiency light reflecting films applied onto their surfaces. However, Dominguez further teaches light reflecting films applied onto the surfaces of its reflectors (col. 9, lines 25-29). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to provide such a reflector including a reflecting

film in combination with the invention of Fujimura to allow for durable and lightweight reflector as taught by Dominguez.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimura (JP Patent Publication No. 61-027517) in view of Dominguez (US Patent No. 4,883,340) and in further view of Corio (US Patent No. 5,317,145).

With respect to claim 26, the combination of Fujimura and Dominguez discloses or suggests all the limitations of claim 1 as stated supra. Though the combination does not expressly disclose the sensor to monitor the sun position is comprised of a light shading post, photosensitive elements arranged in four directions around the post, and a base for burying the photosensitive elements at a certain depth, wherein for each photosensitive element, a reflection shading block is arranged to shade 1/6-1/2 of a receiving window close to a light shading post side wall, such sensors are known in the art. For example, Corio teaches sensor to monitor the sun position is comprised of a light shading post (22), photosensitive elements (32) arranged in four directions around the post, and a base for burying the photosensitive elements at a certain depth, wherein for each photosensitive element, a reflection shading block (23) is arranged to shade 1/6-1/2 of a receiving window close to a light shading post side wall (figs. 2 and 3). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to replace the sensor of Fujimura with the sensor of Corio to provide a low-cost, highly accurate sensor for a solar tracker that maximizes the reflection of solar energy.

Allowable Subject Matter

Claims 4, 5, and 7-14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: With respect to claims 4 and 5, though the prior art discloses or suggests all the limitations of claims 1-3, as stated supra, and further teaches the planar reflectors are substantially rectangular in shape, the prior art of record fails to teach or suggest the aforementioned combination further comprising the connecting lines of four apexes of every two of the adjacent planar reflectors on the same side generally forming a rhombus, in which one of the diagonal lines is parallel with the central axial line of the circular rail.

With respect to claims 7 and 8, though the prior art discloses or suggests all the limitations of claims 1-3, as stated supra, and further teaches the altitudinal angle adjusting mechanism comprises a reciprocating linear moving mechanism and the transversal main turning shaft and the linear movement of the moving part of reciprocating linear moving mechanism pushing the movement of the parallel four-connecting-rod mechanism to adjust the altitudinal angle and spacing of planar reflectors, the prior art of record fails to teach or suggest the aforementioned combination further comprising the reciprocating linear moving mechanism is connected to one of the connecting rods of the parallel connecting rod mechanism via its moving part, a moving line of this part is parallel with one diagonal line of the rhombus.

With respect to claims 9-14, these claims depend on claims 4, 5, 7, or 8 and are allowable at least for the reasons stated supra.

Conclusion

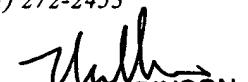
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Consilvio whose telephone number is (571) 272-2453. The examiner can normally be reached on Monday thru Friday, 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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